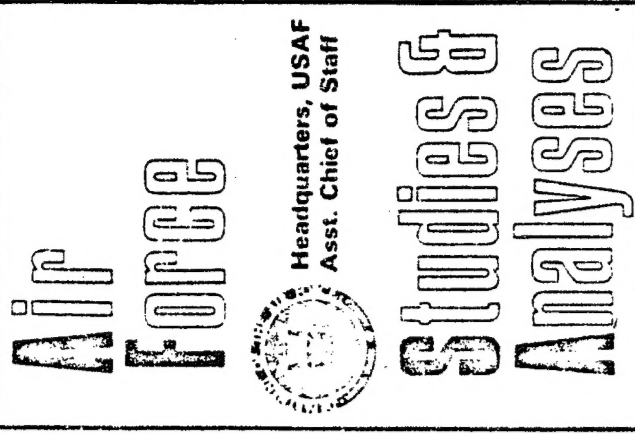


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Administrative And Operational Support Airlift Commonality Briefing

AFSAA Collection

CAPT ROBERT W. TICKNOR
30 NOVEMBER 1982

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Briefing***

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ADMINISTRATIVE AND OPERATIONAL SUPPORT AIRLIFT COMMONALITY:

GOOD _____, I'M CAPT TICKNOR FROM THE MOBILITY DIVISION OF STUDIES AND ANALYSES. THIS BRIEFING COVERS THE ANALYSIS AND THE RESULTS OF OUR SUPPORT AIRLIFT COMMONALITY STUDY.

BACKGROUND

- FIVE DIFFERENT PROGRAMS
 - EUROPEAN DISTRIBUTION SYSTEM AIRCRAFT (EDSA)
 - TANKER-TRANSPORT-BOMBER (TTB) TRAINER FOR ATC
 - SPECIAL AIR MISSION (SAM) AIRCRAFT TO REPLACE C-140
 - OPERATIONAL SUPPORT AIRLIFT (CT-39) REPLACEMENT OR MODERNIZATION
 - REPLACEMENT FLIGHT CHECK AIRCRAFT FOR AFCC
- PREVIOUS STUDIES

BACKGROUND:

THE MISSION AREAS INVOLVED IN THIS STUDY ARE THE FIVE SHOWN ON THIS SLIDE. EACH OF THESE PROGRAMS IS CURRENTLY CONSIDERING A NEW OR REPLACEMENT AIRCRAFT AND ALL ARE EXPECTED TO BE COMMERCIAL OFF-THE-SHELF AIRFRAMES. HOWEVER, IT IS NECESSARY TO KEEP IN MIND THAT THE NUMBER OF AIRCRAFT REQUIRED FOR THESE MISSION AREAS VARIES SIGNIFICANTLY. THE FLIGHT CHECK REPLACEMENT REQUIRES 7 AIRCRAFT WHILE THE SAM REPLACEMENT REQUIRES 11 AND THE EDSA 18. ON THE OTHER HAND, THE ITB REQUIREMENT IS FOR 225 AIRCRAFT AND THE OPERATIONAL SUPPORT AIRLIFT REQUIREMENT IS TAKEN IN THIS STUDY AS 212 AIRCRAFT. THIS NUMBER OF OSA AIRCRAFT IS BASED ON THE RECENTLY COMPLETED AF/XOOTA STUDY ON THE OSA WARTIME REQUIREMENT. WHILE THIS OSA FLEET SIZE HAS NOT BEEN FORMALLY ESTABLISHED IT IS USED IN THIS STUDY AS A REPRESENTATIVE SIZE OSA FLEET. AS LONG AS THE OSA FLEET IS ABOVE APPROXIMATELY 100 AIRCRAFT, THE EXACT NUMBER WILL ONLY EFFECT THE TOTAL NUMBER OF AIRCRAFT IN THE STUDY AND HENCE THE TOTAL COSTS, BUT WILL NOT EFFECT THE COMMONALITY CONSIDERATIONS.

THERE ARE SEVERAL PREVIOUS STUDIES THAT PROVIDED A BASIS FOR THIS STUDY. IN DEC 81, HQ MAC COMPLETED AN OPERATIONAL SUPPORT AIRLIFT STUDY THAT SUGGESTED A MIXED FLEET OF TURBOPROP AND TURBOJET AIRCRAFT. THIS STUDY LOOKED AT THE PEACETIME, CONUS ROLE AND SUGGESTED A MIXED FLEET FOR COST REASONS. THE AF/XOOTA STUDY ALSO SUGGESTED A MIXED TURBOPROP/TURBOFAN OSA FLEET BASED ON THE WARTIME REQUIREMENTS FOR A SHORT RANGE AND A LONG RANGE AIRCRAFT.

ANOTHER SOURCE WAS A 1980 STUDY DONE BY ASD THAT CONCLUDED COMMONALITY BETWEEN OSA AND ITB IS FEASIBLE BUT MAY NOT BE DESIRABLE.

PURPOSE

**ANALYZE, BENEFITS AND IMPACTS OF
AIRFRAME COMMONALITY FOR THE VARIOUS
SUPPORT AIRLIFT PROGRAMS**

PURPOSE:

THE PURPOSE OF THIS STUDY AS DIRECTED BY THE SUPPORT AIRLIFT REQUIREMENTS SENIOR OFFICER
STEERING GROUP IS SHOWN ON THIS SLIDE.

APPROACH

CONSIDER COMMONALITY ON SEVERAL LEVELS

- **MISSION INTERCHANGEABILITY**
- **PROCUREMENT SCHEDULE COMPATABILITY**
- **AIRFRAME CAPABILITIES**
 - **DELINEATE REQUIREMENTS**
 - **ANALYZE AIRCRAFT CAPABILITIES**
- **COST OF VARIOUS OPTIONS**

APPROACH:

THE APPROACH USED WAS TO CONSIDER THE QUESTION OF COMMONALITY ON SEVERAL LEVELS. THE FIRST LOOK WAS TO SEE IF ANY OF THE MISSIONS WERE ONLY OF A WARTIME OR PEACETIME NATURE AND HENCE THE POSSIBILITY OF THE SAME AIRFRAME BEING USED FOR MORE THAN ONE MISSION AREA AT DIFFERENT TIMES. HOWEVER, ALL OF THE MISSIONS ARE ESSENTIALLY 365 DAY A YEAR REQUIREMENTS AND SO AIRFRAME OVERLAP IS NOT POSSIBLE. THE OTHER COMMONALITY CONSIDERATIONS SHOWN HERE WILL BE COVERED IN MORE DETAIL IN THE REST OF THE BRIEFING. I WOULD LIKE TO EMPHASIZE AT THIS POINT THAT THE AIRFRAME REQUIREMENTS DELINEATED WERE TAKEN FROM GENERAL OPERATIONAL REQUIREMENTS, MISSION ELEMENT NEED STATEMENTS, AND EXTENSIVE CONVERSATIONS WITH THE PROGRAM ELEMENT MONITORS AND MAJCOM'S.

DESIRED AIRCRAFT ACQUISITIONS

| MISSION | FY-83 | FY-84 | FY-85 | FY-86 | FY-87 | FY-88 | FY-89 | FY-90 | FY-91 | TOTAL |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| EDSA | 2 | 16 | | | | | | | | 18 |
| SAM1 | (4) | (4) | 4 | 3 | 3 | 1 | | | | 11 |
| FLIGHT CHECK | | | 1 | 2 | 3 | 1 | | | | 7 |
| T1B | | | 1 | 18 | 29 | 44 | 48 | 48 | 37 | 225 |
| PROB OSA2 | | 12 | 35 | 35 | | | | | | 212 |
| JET3 | | | | | 43 | 44 | 43 | | | |
| YEARLY TOTAL | 2 | 28 | 41 | 58 | 78 | 90 | 91 | 48 | 37 | 473 |

1. PLAN TO LEASE 4 AIRCRAFT IN 83 AND 84.
2. ACQUISITION TIMING IS APPROXIMATE - NOT CURRENTLY FUNDED.
3. POTENTIAL LEASE OF 122 STARTING IN FY 83.

DESIRED AIRCRAFT ACQUISITIONS:

THE DESIRED ACQUISITION SCHEDULE FOR EACH PROGRAM IS SHOWN HERE. THE EXCEPTION IS THE OSA ACQUISITION SCHEDULE. ALTHOUGH AN OSA ACQUISITION SCHEDULE IS SHOWN, IT IS NOT CURRENTLY FUNDED AND IS SHOWN ONLY TO REPRESENT A REASONABLE SCHEDULE FOR PROCUREMENT COMPATIBILITY COMPARISONS. THE DESIRED TIMING FOR THE VARIOUS PROGRAMS SHOWS THEY COULD BE EASILY COMBINED OR IN SOME CASES ONE COULD BE ADDED ON TO THE END OF ANOTHER ONE. EVEN WITH THE APPROXIMATELY 90 AIRCRAFT PER YEAR REQUIRED IN FY 88-90, CONVERSATIONS WITH MANUFACTURERS INDICATE THAT THIS IS WELL WITHIN THEIR PRODUCTION CAPABILITY. THE RESULT THEN IS THAT FROM AN ACQUISITION TIMING STANDPOINT THE VARIOUS PROGRAMS ARE COMPATIBLE.

DESIRED AIRFRAME CHARACTERISTICS

| | RANGE (NM) | PAYLOAD | SPEED | RUNWAY (FT) |
|----------------------|-------------|-------------------------------|---------------------------------------|---------------------------|
| EDSA | 700 | F-100 ENGINE (4200 LBS) | 140 KTS | 2000 T.O. & LANDING |
| OSA SHORT RANGE | 500 - 700 | 8 - 10 PAX 1800 - 2000 LBS | 240 KTAS | 3000 T.O. & LANDING |
| OSA LONG RANGE | 1500 - 2000 | 6 - 8 PAX 1800 - 2000 LBS | .7M | 5000 T.O. & LANDING |
| T1B | 1500 | ---- | .75M CRUISE 300 KTAS @ 500 FEET | ---- |
| AFCC FLIGHT CHECK | 2400 | 6 PAX | .8M | 5000 T.O. 4500 LANDING |
| SAM MEDIUM RANGE | 1800 | 14 - 18 PAX | .8M | 5000 T.O. 4500 LANDING |
| SAM LONG RANGE | 2200 | 14 - 18 PAX | .8M | 5000 T.O. 4500 LANDING |

DESIRED AIRFRAME CHARACTERISTICS:

TURNING NOW TO THE DESIRED AIRFRAME CHARACTERISTICS, THIS DATA WAS COMPILED FROM GOR'S, MENS, AND DISCUSSIONS WITH THE PEMS AND MAJCOMS. MOST OF THESE CHARACTERISTICS ARE CONTAINED IN THE RESPECTIVE GORS AND MENS. AGAIN THE EXCEPTION IS THE OSA MISSION AREA. THE DATA SHOWN FOR RANGE AND PAYLOAD REQUIREMENTS IS BASED ON THE RECENTLY COMPLETED AF/XOOTA OSA WARTIME REQUIREMENTS STUDY, WHILE THE MAC GOR STATES 2000NM RANGE FOR AN OSA JET (LONG RANGE) WITH 1800 POUND PAYLOAD CAPABILITY AND 1500NM RANGE FOR A TURBOPROP (SHORT RANGE) WITH 2100 POUND PAYLOAD CAPABILITY.

WHILE THIS IS NOT AN EXHAUSTIVE LIST OF REQUIREMENTS IT SHOWS THE MAJOR FACTORS THAT AFFECT THE ABILITY OF VARIOUS AIRCRAFT TO PERFORM A GIVEN MISSION.

CANDIDATE AIRCRAFT

| | EDSA | OSA SHORT RANGE | OSA LONG RANGE | TTB | FLIGHT CHECK | SAM MEDIUM RANGE | SAM LONG RANGE |
|--------------------|------|-----------------------|----------------------|-----|-----------------|------------------------|----------------------|
| GULFSTREAM III | | | X | X | X | X | X |
| CANADAIR CL600 | | | X | X | X | X | |
| FALCON 50 | | | X | X | X | | |
| LEAR 55 | | | X | X | X | | |
| WESTWIND II | | | X | X | X | | |
| SABRE 65 | | | X | X | | | |
| WESTWIND I | | | X | X | | | |
| CITATION III | | | X | X | | | |
| LEAR 35A | | | X | X | | | |
| FALCON 10 | | | | X | | | |
| DIAMOND I | | | | X | | | |
| CITATION II | | X | | | | | |
| LEARFAN | | X | | | | | |
| BEECH 200 (C-12) | | X | | | | | |
| SAAB-FAIRCHILD 340 | | X | | | | | |
| AERITALIA G-222 | X | X | | | | | |
| BUFFALO | X | X | | | | | |
| SHORTS SD330 | X | X | | | | | |
| AHERNS 404 | X | X | | | | | |

CANDIDATE AIRCRAFT:

BASED ON THE DESIRED CHARACTERISTICS SHOWN ON THE PREVIOUS SLIDE, HERE IS A LIST OF SOME POTENTIAL CANDIDATE AIRCRAFT WITH "Xs" INDICATING THE MISSIONS A GIVEN AIRCRAFT CAN PERFORM. CONSIDERATION HAS NOT BEEN GIVEN TO POSSIBLE AIRCRAFT MODIFICATIONS. THIS IS NOT NECESSARILY A COMPLETE LIST OF SUITABLE AIRCRAFT BUT IS CERTAINLY REPRESENTATIVE OF THE RANGE AND CAPABILITIES OF AIRCRAFT THAT ARE AVAILABLE. IT CAN EASILY BE SEEN THAT WHILE THERE IS A VARIETY OF AIRCRAFT THAT CAN ACCOMPLISH MORE THAN ONE MISSION, THERE IS NO AIRCRAFT THAT CAN ACCOMPLISH ALL THE MISSIONS.

INDIVIDUAL AIRCRAFT BUYS

| MISSION | # AIRCRAFT | AIRCRAFT TYPE | ACQUISITION COST (FY 82 \$M) | 20 YEAR LCC (FY 82 \$M) |
|--------------------|---------------|------------------|------------------------------------|-------------------------------|
| SAM (C-140) | 11 | GULFSTREAM III | 130.83 | 545.31 |
| FLIGHT CHECK | 7 | WESTWIND II | 32.18 | 161.11 |
| EDS | 18 | AHRENS 404 | 32.59 | 387.41 |
| TIB | 225 | DIAMOND I | 443.70 | 4020.85 |
| OSA LONG RANGE | 130 | LEAR 35A | 400.69 | 2262.49 |
| OSA SHORT RANGE | 82 | BEECH 200 | 128.69 | 1203.09 |
| TOTAL | 473 | | 1168.68 | 8580.26 |

NOTE: COST DATA PROVIDED BY AF/ACMC

INDIVIDUAL AIRCRAFT BUYS:

USING THE INFORMATION FROM THE PREVIOUS CHART, I HAVE CONSIDERED EACH MISSION AREA SEPARATELY AND PICKED THE AIRCRAFT WITH THE LOWEST 20 YEAR LIFE CYCLE COST THAT MEETS THE STATED MISSION REQUIREMENTS. THE RESULT IS 6 AIRCRAFT TYPES; A DIFFERENT AIRCRAFT FOR EACH MISSION AREA. ALTHOUGH THE CURRENT PLAN IS TO PROVIDE FOR A SPLIT FLEET FOR THE SAM AIRCRAFT, THE COST DATA AVAILABLE DOES NOT SHOW ANY SAVINGS FROM THIS APPROACH, SO THE SAM FLEET IS SHOWN WITH JUST ONE AIRCRAFT TYPE. IN REALITY THE COMPETITION FOR THE SAM MEDIUM RANGE AIRCRAFT MAY IN FACT MAKE THE SPLIT FLEET A LOWER COST OPTION BUT THIS SAVINGS CANNOT BE ESTIMATED WITH THE DATA CURRENTLY AVAILABLE. THIS MIX OF AIRCRAFT TYPES RESULTS IN AN ESTIMATED TOTAL 20 YEAR LIFE CYCLE COST OF JUST UNDER 8.6 BILLION DOLLARS. THIS TOTAL COST WILL BE USED AS A REFERENCE POINT FOR COMPARING VARIOUS COMMONALITY OPTIONS.

ALSO NOTE THAT ALL THE COST DATA USED IN THE BRIEFING WAS PROVIDED BY AF/ACMC.

COMMONALITY OPTIONS

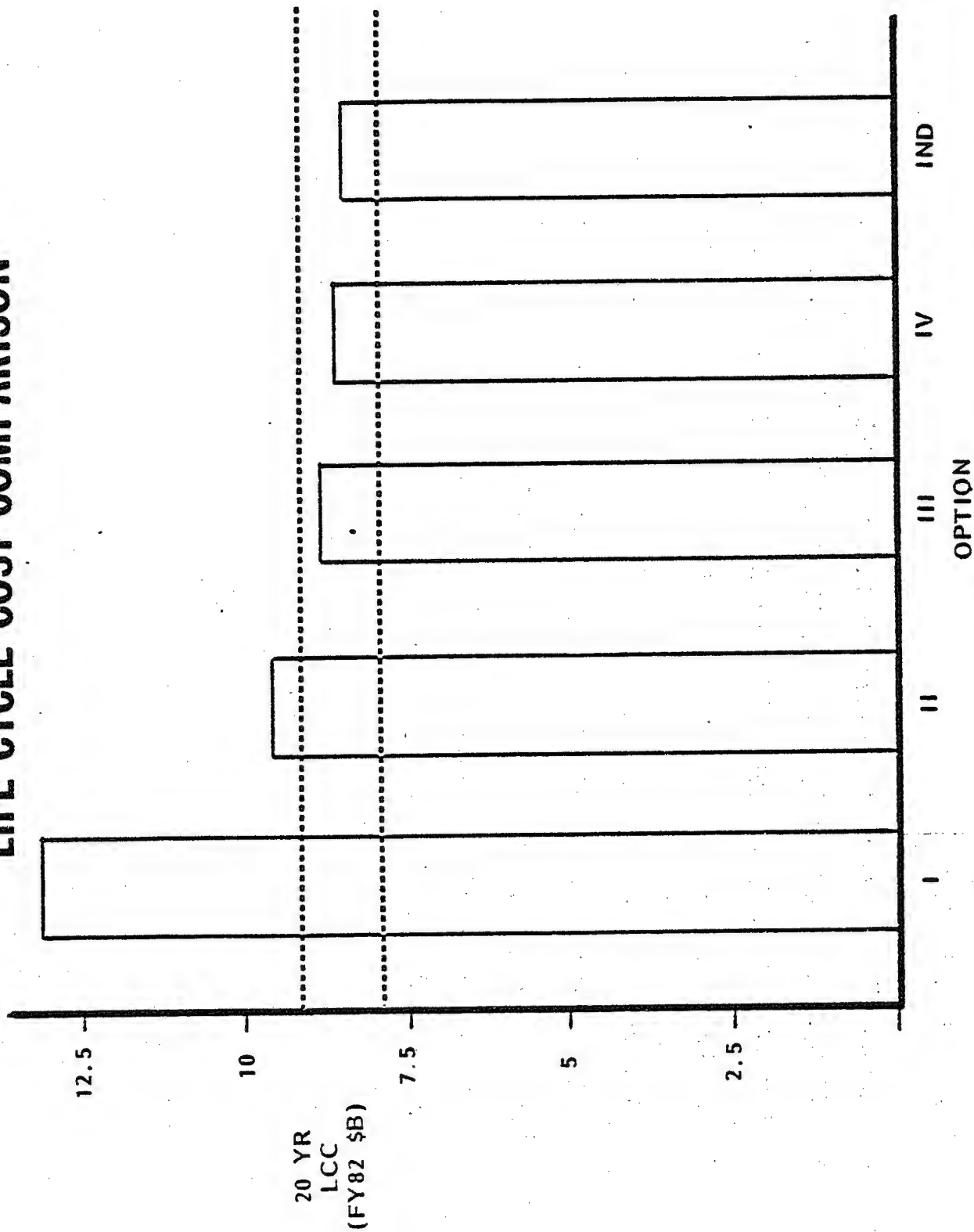
(WITH STATED REQUIREMENTS)

| | | | |
|----|--|-----|---|
| I | 373 G-III (SAM, FC, TTB, OSA) 100 AHRENS (EDSA, OSA) | III | 11 G-III (SAM) 7 WESTWIND II (FC) 355 LEAR 35A (TTB, OSA) 100 AHRENS (EDSA, OSA) |
| II | 11 G-III (SAM) 362 WESTWIND II (FC, TTB, OSA) 100 AHRENS (EDSA, OSA) | IV | 11 G-III (SAM) 7 WESTWIND II (FC) 225 DIAMOND I (TTB) 130 LEAR 35A (OSA) 100 AHRENS (EDSA, OSA) |

COMMONALITY OPTIONS (WITH STATED REQUIREMENTS):

HERE ARE SOME POSSIBLE OPTIONS USING THOSE AIRCRAFT THAT CAN PERFORM MORE THAN ONE MISSION. THESE ARE CERTAINLY NOT ALL THE OPTIONS THAT COULD BE DEvised BUT ARE REPRESENTATIVE AND REFLECT THE RANGE OF COMMONALITY OPTIONS AVAILABLE.

LIFE CYCLE COST COMPARISON



LIFE CYCLE COST COMPARISON:

THIS CHART SHOWS THE 20 YEAR LIFE CYCLE COSTS FOR THOSE OPTIONS SHOWN ON THE PREVIOUS SLIDE. IT IS EASY TO SEE THAT OPTION I, WITH 373 GULFSTREAM IIIs, ALTHOUGH USING ONLY 2 AIRCRAFT TYPES, IS A VERY EXPENSIVE OPTION. THE OPTION ON THE FAR RIGHT IS THE BASE CASE USING AN INDIVIDUAL AIRCRAFT BUY FOR EACH MISSION AREA.

THE HORIZONTAL DOTTED LINES SHOW A BRACKET OF $\pm 7\%$ FROM THE INDIVIDUAL AIRCRAFT OPTION. THIS IS THE APPROXIMATE RANGE OF ESTIMATING ACCURACY. WITHIN THIS RANGE, IT IS NOT POSSIBLE TO SAY THERE IS ANY STATISTICALLY SIGNIFICANT DIFFERENCE IN COST. THIS IMPLIES THAT, WITHIN ESTIMATING ERROR, OPTIONS III AND IV WITH 4 AND 5 DIFFERENT AIRCRAFT TYPES, RESPECTIVELY, ARE THE SAME COST AS THE INDIVIDUAL OPTION.

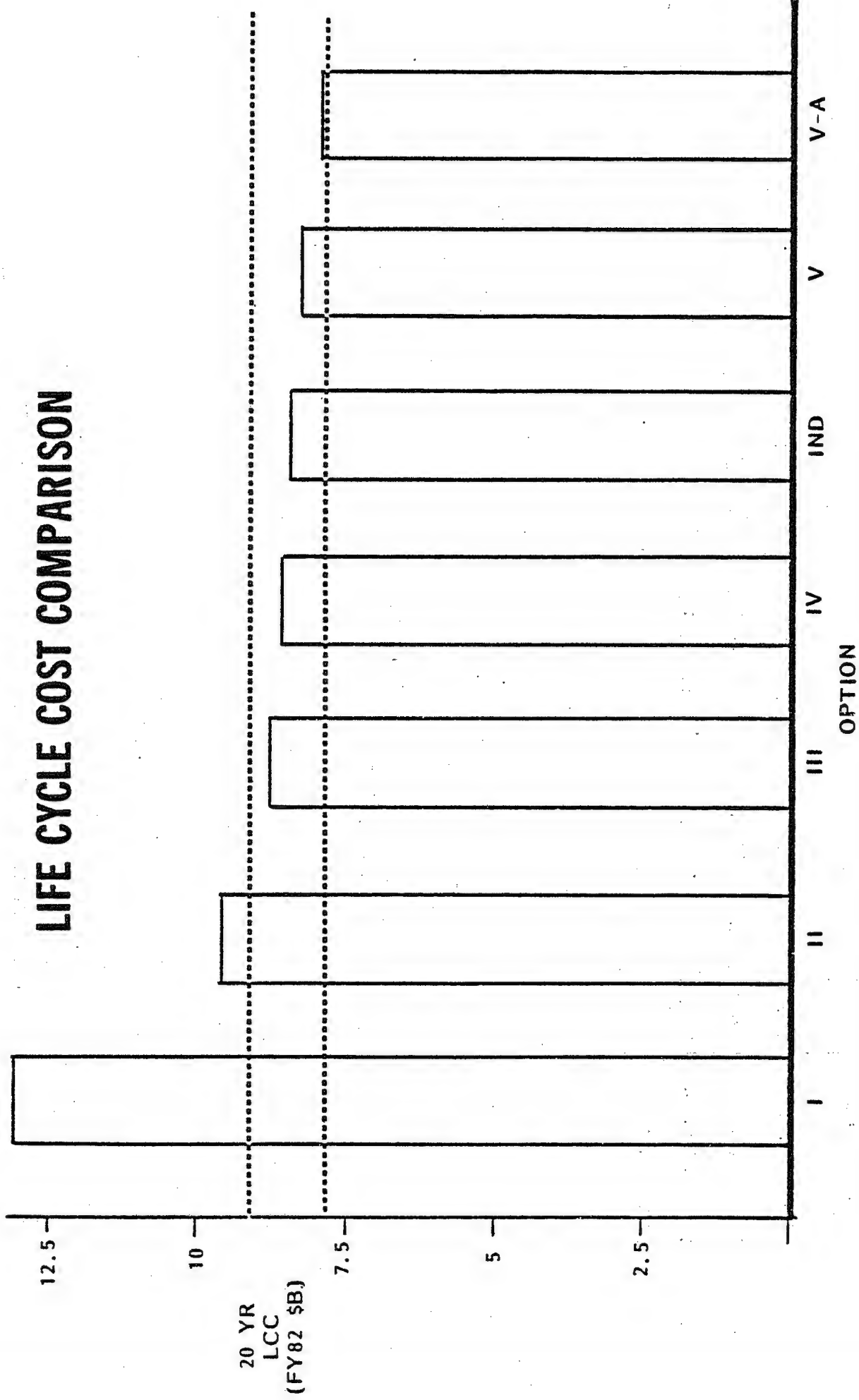
LEARFAN POTENTIAL

| | |
|-----|----------------------|
| V | 11 G-III (SAM) |
| | 7 WW II (FC) |
| | 225 DIAMOND I (TTB) |
| | 130 LEAR 35 (OSA) |
| | 82 LEARFAN (OSA) |
| | 18 AHRENS 404 (EDSA) |
| V-A | 11 G-III (SAM) |
| | 7 WW II (FC) |
| | 225 DIAMON I (TTB) |
| | 64 LEAR 35 (OSA) |
| | 148 LEARFAN (OSA) |
| | 18 AHRENS 404 (EDSA) |

LEARFAN POTENTIAL:

IT SEEMS IMPORTANT TO BRIEFLY LOOK AT THE LEARFAN--A STATE-OF-THE-ART PROPFAN CONSTRUCTED LARGELY OF COMPOSITE MATERIALS. THE LEARFAN HAS A CRUISING SPEED BETWEEN THE CONVENTIONAL TURBOPROP AND JET BUT GREATER EFFICIENCY THAN THE TURBOPROPS. OPTION V SHOWS THE LEARFAN IN PLACE OF THE BEECH SUPER KING AIR 200 (C-12) AS THE SHORT RANGE OSA AIRCRAFT. OPTION V-A IS AN EXCURSION USING 70% LEARFANS AND 30% JETS FOR THE OSA FLEET. THIS MIX WAS SUGGESTED BY THE MAC STUDY UNDER THE ASSUMPTION THAT THE FASTER LEARFANS COULD BE USED FOR A LARGER PORTION OF THE OSA MISSIONS THAN A CONVENTIONAL TURBOPROP.

LIFE CYCLE COST COMPARISON



LIFE CYCLE COST COMPARISON:

THIS IS THE SAME LCC CHART AS BEFORE WITH THE LEARFAN OPTIONS ADDED. IT SHOWS THE LEARFAN OPTIONS TO BE SLIGHTLY CHEAPER THAN THE BASE CASE INDIVIDUAL AIRCRAFT OPTION AND WITHIN THE 7% RANGE OF ESTIMATING ERROR. IT ALSO INDICATES POTENTIAL FOR COST SAVINGS FROM NEW TECHNOLOGY CONCEPTS.

#

REQUIREMENTS MODIFICATIONS:

THESE ARE SOME MODIFICATIONS TO THE REQUIREMENTS THAT WERE INVESTIGATED TO DETERMINE WHAT EFFECT THEY MIGHT HAVE ON COMMONALITY AND COSTS. THERE ARE OTHER MODIFICATIONS TO THE REQUIREMENTS THAT COULD BE PROPOSED, HOWEVER THESE ARE THE ONES THAT SEEMED MOST REASONABLE IN TERMS OF PROVIDING AIRFRAME COMMONALITY. THE MIXES OF AIRCRAFT OPTIONS IMPLIED BY THESE MODIFICATIONS WILL BE SHOWN ON THE NEXT SLIDE. THE LAST MODIFICATION WITH THE SAM MEDIUM RANGE PASSENGER REQUIREMENT REDUCED IS NOT SHOWN AS AN OPTION BECAUSE THE SMALL NUMBER OF AIRCRAFT INVOLVED MAKES VERY LITTLE DIFFERENCE IN THE 20 YEAR LCC FOR THE ENTIRE FLEET.

COMMONALITY OPTIONS

(MODIFIED REQUIREMENTS)

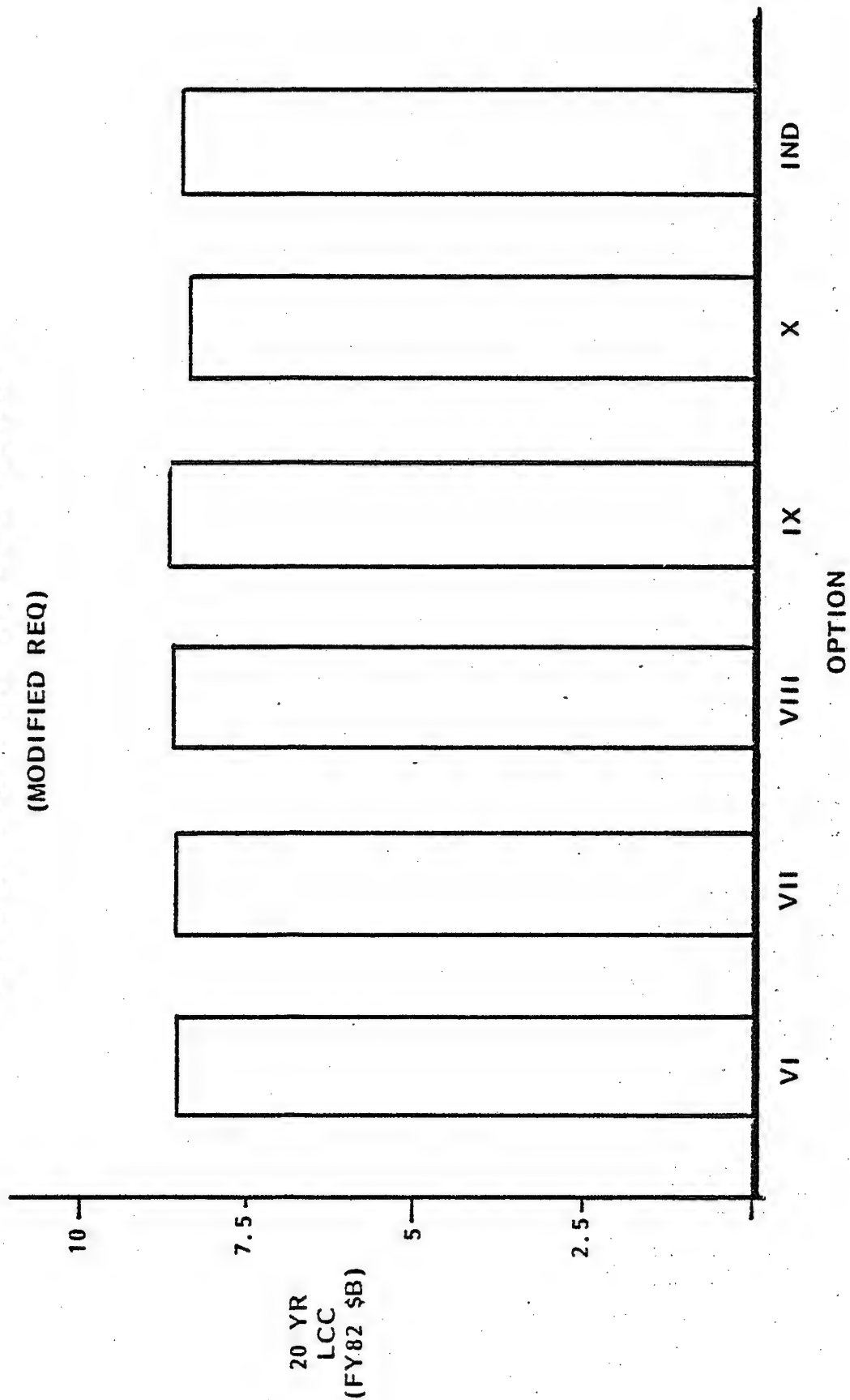
| | | | |
|-----|---------------------------|-----|----------------------------------|
| VI | 11 G-III (SAM) | VII | 11 G-III (SAM) |
| | 7 WW II (FC) | | 137 LEAR 35 (FC, OSA) |
| | 130 LEAR 35 (OSA) | | 307 CITATION II (OSA, TTB) |
| | 225 DIAMOND I (TTB) | | 18 AHRENS 404 (EDSA) |
| | 100 BEECH 200 (EDSA, OSA) | IX | 11 G-III (SAM) |
| | | | 137 LEAR 35 (FC, OSA) |
| VII | 11 G-III (SAM) | | 325 CITATION II (OSA, TTB, EDSA) |
| | 137 LEAR 35 (FC, OSA) | X | 11 G-III (SAM) |
| | 225 DIAMOND I (TTB) | | 137 LEAR 35 (FC, OSA) |
| | 100 BEECH 200 (EDSA, OSA) | | 307 DIAMOND I (TTB, OSA) |
| | | | 18 AHRENS 404 (EDSA) |

COMMONALITY OPTIONS (MODIFIED REQUIREMENTS):

THIS SLIDE SHOWS THE AIRCRAFT MIXES THAT COULD RESULT FROM THE REQUIREMENTS MODIFICATIONS SHOWN ON THE PREVIOUS SLIDE. THESE OPTIONS ALL HAVE THE SAME NUMBER OF TOTAL AIRCRAFT BUT RANGE BETWEEN 5 AND 3 DIFFERENT AIRCRAFT TYPES AS SHOWN IN OPTIONS VI AND IX RESPECTIVELY.

LIFE CYCLE COST COMPARISON

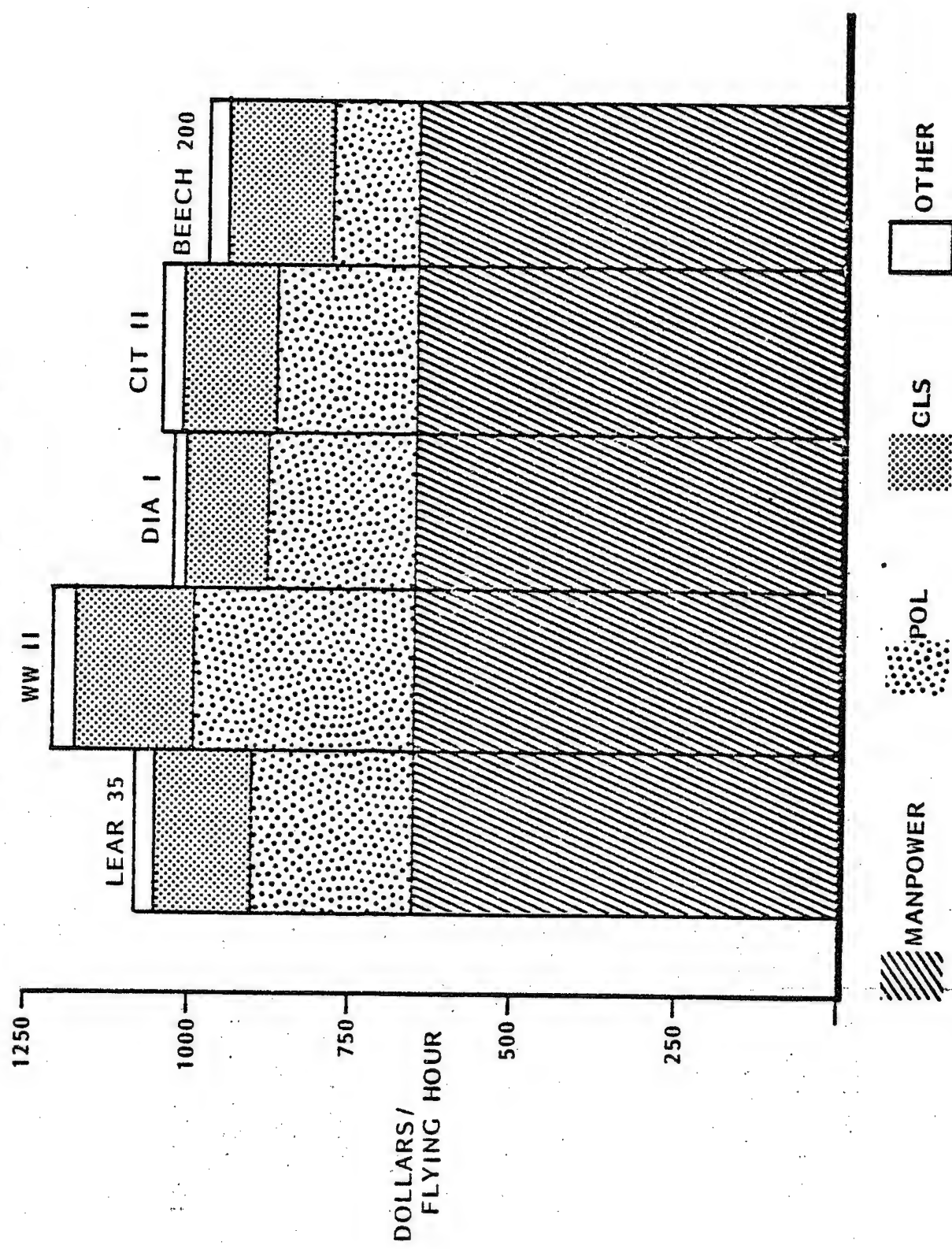
(MODIFIED REQ)



LIFE CYCLE COST COMPARISON (MODIFIED REQUIREMENTS):

HERE ARE THE LIFE CYCLE COSTS FOR THE VARIOUS OPTIONS USING THE AIRCRAFT MIXES SHOWN ON THE LAST SLIDE. AGAIN, THE OPTION WITH A SEPARATE AIRCRAFT TYPE FOR EACH MISSION IS SHOWN ON THE RIGHT SIDE OF THE SLIDE. AS CAN BE SEEN, WITH THOSE COSTS THAT CAN BE REASONABLY ESTIMATED, THERE IS ESSENTIALLY NO COST DIFFERENCE BETWEEN ANY OF THESE OPTIONS. THE LIFE CYCLE COSTS ARE ALL WITHIN ABOUT 2%--WELL WITHIN THE RANGE OF ESTIMATING ERROR.

TYPICAL O&S COSTS



TYPICAL O&S COSTS:

A MAJOR REASON FOR THE LACK OF EFFECT OF COMMONALITY ON LIFE CYCLE COSTS IS SHOWN ON THIS SLIDE. SINCE OPERATING AND SUPPORT COSTS ARE THE MAJOR PORTION OF 20 YEAR LIFE CYCLE COSTS, THE EFFECT OF COMMONALITY ON O&S COSTS IS A SIGNIFICANT CONSIDERATION. WHILE THESE COSTS ARE SHOWN AS DOLLARS PER FLYING HOUR, THE SAME RELATIONSHIP WOULD HOLD FOR 20 YEAR O&S COSTS.

ALTHOUGH THIS GRAPH SHOWS TYPICAL AIRCRAFT FOR THE OSA MISSION, A SIMILAR GRAPH COULD BE DRAWN FOR ANY MISSION AREA. IT SHOWS THAT MANPOWER COSTS ARE MORE THAN 50% OF THE O&S COSTS AND THAT THIS COST IS THE SAME REGARDLESS OF THE AIRCRAFT TYPE. THE MANPOWER COSTS ARE ALSO RELATIVELY INSENSITIVE TO COMMONALITY. FOR EXAMPLE, IT STILL TAKES 2 PILOTS TO FLY THE AIRCRAFT NO MATTER WHICH TYPE IT IS. THE POL COSTS VARY WITH EACH AIRCRAFT TYPE BUT ARE NOT AFFECTED AT ALL BY COMMONALITY. THE CONTRACTOR LOGISTICS SUPPORT COST IS ALSO ONLY SLIGHTLY AFFECTED BY COMMONALITY. THIS IS ESPECIALLY TRUE FOR THE OSA MISSION WITH A LARGE NUMBER OF AIRCRAFT ALREADY INVOLVED.

COMMONALITY FACTORS

- **DECREASED TRAINING COSTS**
- **SPO COSTS**
- **INCREASED FLEXIBILITY**
- **MANUFACTURING CAPABILITY**

COMMONALITY FACTORS:

THESE ARE SOME FACTORS THAT POTENTIALLY HAVE AN EFFECT ON COMMONALITY BUT WERE NOT INCLUDED IN THE ANALYSIS.

DECREASED TRAINING COSTS COULD RESULT FROM A COMMON AIRFRAME BETWEEN TTb AND OSA. ASSUMING THAT A TTb GRADUATE COULD IMMEDIATELY TRANSITION TO AN OSA COPILOT, THEN BASED ON THE CURRENT COST TO MAKE UPT GRADUATES T-39 COPILOTS, 25 - 40 MILLION DOLLARS COULD BE SAVED OVER 20 YEARS, DEPENDING ON THE NUMBER OF PILOTS MAKING THE TRANSITION.

THE SPO COSTS COULD BE AFFECTED BY HAVING ONE SPO FOR A SINGLE AIRCRAFT TYPE INSTEAD OF TWO SPO'S FOR TWO TYPES OF AIRCRAFT. BY HAVING ONE AIRCRAFT TYPE FOR TWO, OR MORE, MISSION AREAS, THERE IS INCREASED FLEXIBILITY IN THAT IT IS THEN POSSIBLE TO SHIFT AIRCRAFT FROM ONE MISSION AREA TO ANOTHER AS NEEDED.

GIVEN THE CURRENT STATE OF THE ECONOMY THE POTENTIAL EXISTS FOR ANY PARTICULAR MANUFACTURER TO MAKE AN ESPECIALLY ATTRACTIVE OFFER TO THE AIR FORCE. HOWEVER, I DID NOT TRY TO ESTIMATE THE POTENTIAL SINCE IT IS SUBJECT TO CHANGE AND WOULD NOT BE RELIABLE WITHOUT A SPECIFIC RFP BEING SUBMITTED.

COMMONALITY FACTORS (CONT'D)

- **USE FAMILY OF AIRCRAFT**
- **AIR FORCE MAINTENANCE**
- **GROWTH POTENTIAL**
- **OTHER SERVICES**

COMMONALITY FACTORS (CONTINUED):

ANOTHER POSSIBILITY IS USING A FAMILY OF AIRCRAFT TO MEET SEVERAL MISSION AREAS. WHILE NOT PROVIDING COMPLETE COMMONALITY, THERE MAY BE ENOUGH COMMONALITY OF STRUCTURE AND COMPONENTS THAT A MANUFACTURER MAY BE WILLING TO PROVIDE A PACKAGE DEAL AT A LOWER COST.

THE EFFECT ON COMMONALITY OPTIONS OF COMPLETE AIR FORCE MAINTENANCE, INSTEAD OF CLS, WAS NOT EXPLICITLY COSTED, BUT DISCUSSIONS WITH THE AC AND LE COMMUNITIES INDICATE THAT ANY COMMONALITY SAVINGS WOULD BE IN THE RANGE OF 2-3%--WELL WITHIN THE NOISE LEVEL OF THE COST ESTIMATIONS. THE VALUE OF AN AIRFRAME WITH THE CAPABILITY FOR EXPANSION OR MODIFICATION SHOULD ALSO BE CONSIDERED IN ADDRESSING COMMONALITY.

FINALLY, THE CONCEPT OF A JOINT SERVICE PROGRAM WAS NOT INVESTIGATED IN DETAIL. HOWEVER, THE POSSIBILITY EXISTS AT LEAST IN PRINCIPLE. THE NAVY HAS ABOUT 60 C-12s AND IS PLANNING TO BUY 20 - 60 MORE STARTING IN FY 85. THE ARMY HAS ABOUT 80 C-12s AND A STATED REQUIREMENT FOR A TOTAL OF 365 SUPPORT AIRCRAFT. THEY ARE CURRENTLY STARTING TO EXPLORE THE CONCEPT OF LEASING AIRCRAFT AND EXPRESSED INTEREST IN A JOINT LEASE OR BUY PROGRAM IF THERE IS A COST BENEFIT TO BE GAINED.

SURVIVABILITY CONSIDERATIONS

| CANDIDATES FOR FC OR OSA OR EDS MISSIONS | | | | | | | | | | |
|--|--------------|----------|------------|----------------|--------------|--------|---------------|-----------------|---------|--------------------|
| SURVIVABILITY QUALITIES | FALCON 50 | WW 11 | LEAR 35 | CITATION 11 | BEECH 200 | SF-340 | AHRENS 404 | SHORTS SD330 | BUFFALO | AERITALIA G-222 |
| SYSTEM REINUNDANCY | | | | | | | | | | |
| AUTONOMOUS NAVIGATION | | | | | | | | | | |
| PERFORMANCE ENVELOPE | X | | | | | X | | | | |
| GROUND SERVICE TIME | | | | | | | | | | |
| WEIGHT/ VOLUME/POWER GROWTH POTENTIAL | X | | | | | X | | | X | X |

SURVIVABILITY CONSIDERATIONS:

WHILE NOT DIRECTLY A COMMONALITY CONSIDERATION, THESE ARE SOME SURVIVABILITY FACTORS THAT SHOULD BE CONSIDERED IN CHOOSING THE FLIGHT CHECK, OSA, AND EDSA AIRCRAFT SINCE THESE ARE THE ONES THAT COULD BE REQUIRED TO OPERATE IN A THREAT ENVIRONMENT. NONE OF THE AIRCRAFT SHOWN CAN DO ALL THREE OF THE MISSIONS BUT ALL ARE CANDIDATES FOR AT LEAST ONE MISSION AREA. THIS IS MEANT TO BE A QUALITATIVE ANALYSIS WITH THE "Xs" SHOWING THOSE AREAS WHERE AN AIRCRAFT HAS AN ADVANTAGE. IN TERMS OF BOTH THE PERFORMANCE ENVELOPE AND THE GROWTH POTENTIAL THOSE AIRCRAFT WITH AN "X" ARE LARGER AND HENCE HAVE SOME EXCESS CAPABILITY. HOWEVER, THEY ARE ALSO MORE EXPENSIVE.

OBSERVATIONS

- AIRFRAME COMMONALITY IS POSSIBLE FOR SOME MISSIONS
- LIFE CYCLE COSTS RELATIVELY INSENSITIVE TO AIRCRAFT MIX
- POTENTIAL BENEFITS DEPENDENT ON:
 - AIR FORCE APPROACH
 - MISSION REQUIREMENTS
 - RFP COORDINATION
- MANUFACTURERS' RESPONSES

OBSERVATIONS:

BASED ON THIS ANALYSIS THERE ARE SEVERAL OBSERVATIONS THAT ARE PERTINENT TO THE QUESTION OF AIRFRAME COMMONALITY AMONG ADMINISTRATIVE AND SUPPORT AIRLIFT MISSIONS.

FIRST, WHILE A SINGLE AIRFRAME CANNOT SATISFY ALL FIVE MISSION AREAS STUDIED, COMMONALITY IS POSSIBLE FOR SOME MISSION AREAS. HOWEVER, IT MAY NOT BE DESIRABLE FOR COST OR AIRCRAFT CAPABILITIES REASONS. SECOND, THE LIFE CYCLE COSTS ARE RELATIVELY INSENSITIVE TO THE AIRCRAFT MIX. THIS IS DUE IN LARGE PART TO THOSE OPERATING AND SUPPORT COSTS THAT ARE NOT AFFECTED BY COMMONALITY.

HOWEVER, THERE ARE SOME POTENTIAL BENEFITS TO COMMONALITY BUT THEY ARE VERY DEPENDENT ON BOTH THE AIR FORCE APPROACH AND THE MANUFACTURERS' RESPONSES.. IN ORDER TO TAKE ADVANTAGE OF ANY COMMONALITY BENEFITS, COORDINATED REQUESTS FOR PROPOSALS (RFPs), OR POSSIBLY A JOINT RFP, FOR THESE DIFFERENT PROGRAMS WOULD SEEM APPROPRIATE. IF THE RFPs WERE WRITTEN TO ALLOW FOR A HIGH DEGREE OF FLEXIBILITY IN THE MANUFACTURES' PROPOSALS, THE AIR FORCE MAY REALIZE A GREATER BENEFIT IN HAVING MORE FAVORABLE OPTIONS TO SELECT FROM.

FINALLY, ANY BENEFITS OF COMMONALITY COULD BE SIGNIFICANTLY ALTERED BY WHAT A PARTICULAR MANUFACTURER WOULD OFFER UNDER THE CURRENT MARKET CONDITIONS. THERE WOULD APPEAR TO BE POTENTIAL FOR SIGNIFICANT PRICE BREAKS FROM THE BROCHURE PRICES USED IN THIS STUDY BUT THE EXTENT OF THESE WILL NOT BE KNOWN WITH ANY CERTAINTY UNTIL WE RECEIVE RESPONSES TO AN RFP OR RFP'S.